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# **SOLDIER AND FOOD SERVICE PERSONNEL ATTITUDES TOWARD NUTRITION INITIATIVES**

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Soldiers' and food service personnel's perceptions and attitudes toward the Nutrition Initiatives, as well as their nutrition awareness and knowledge, were assessed via questionnaires and interviews at the Ft. Riley NCO Academy civilian-contractor operation and at Ft. Lewis. Results indicate: 1. Soldiers who want to lose weight use the food information cards. 2. More females than males are interested in weight reduction. 3. Weight conscious soldiers tend to choose nutritious, low calorie food. 4. Weight maintenance and nutrition awareness are related. 5. Troops have more knowledge about practical nutrition than specific food nutrients. 6. When asked to indicate the lower calorie or more nutritious item of two alternative foods most soldiers were able to correctly identify the more nutritious or low calorie item. However, fewer soldiers indicated they would actually choose to eat the lower calorie or more nutritious item in a serving line. 7. Generalization of these results is limited due to sample limitations.					
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## Preface

The present investigation on the determination of soldiers and food service personnel's attitudes, knowledge and behavior toward the nutrition initiatives was conducted by the Human Factors Branch of the Behavioral Sciences Division, Science and Advanced Technology Directorate under work unit CUS1167 under project number 87PP7814.

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# SOLDIER AND FOOD SERVICE PERSONNEL ATTITUDES TOWARD NUTRITION INITIATIVES

## INTRODUCTION

Most efforts to change dietary behavior in the United States have focused on reducing fat, salt and sugar intake, and redistributing the proportions of food items consumed to include more wholesome foods (U.S. Senate, 1977).<sup>1</sup> Evaluation of these programs reveals: there is a positive relationship<sup>2</sup> between education and nutrition knowledge (Murray, 1977); programs produce increases in nutrition-related knowledge (Looker, Walker, Hamilton & Shannon, 1982);<sup>3</sup> attendance at nutrition education programs produces positive attitudes toward nutrition education (Carruth & Musgrave, 1979);<sup>4</sup> the United States Department of Agriculture (USDA) guidelines most frequently adhered to by females are related to reducing body fat, whereas those adhered to by men are related to the prevention of cardiovascular disease (van den Reek & Keith, 1984).<sup>5</sup>

In 1985 the Army implemented a series of initiatives to improve the physical fitness, weight control, and nutritional awareness of its troops. These steps were designed to : (1) instill in soldiers an awareness of the importance of nutrition, (2) create a desire to eat nutritious meals and maintain a "Fit to Fight" attitude, (3) educate soldiers to make appropriate food choices, (4) provide a variety of nutritious menu alternatives to the soldiers, and (5) modify menus to reduce salt and fat consumption.

Office of the Deputy Chief of Staff for Logistics (ODCSLOG) tasked the Military Nutrition Division, U.S. Army Research Institute of Environmental Medicine (USARIEM), to evaluate the impact of the initiatives and tasked U.S. Army Forces Command (FORSCOM) and U.S. Army Training and Doctrine Command (TRADOC) to identify appropriate test units. The three main objectives of the Military Nutrition Division's research effort were to collect food selection and nutrient consumption data in garrison dining facilities, to compare consumption patterns with the recommendations of the Office of The Surgeon General, and compare contract versus military dining facilities. The Military Nutrition Division (Schnakenberg, 1986)<sup>6</sup> requested the Behavioral Science Division, Science and Advanced Technology Directorate, to assess the food service personnel's perceptions of, and attitudes towards, the Nutrition Initiatives and to evaluate the military consumer's nutrition attitudes, awareness and behavior as an adjunct of USARIEM's effort to evaluate actual consumption. A military operation using the Master Menu

at Fort Lewis, and a civilian-contract operation not using the Master Menu at Fort Riley, were chosen as test sites by ODCSLOG because comparison of the consumption data from these two facilities would suggest whether or not contractors should use the Master Menu. Also, data from these two locations provided nutrient consumption comparisons between soldiers who were required to eat all meals in the dining facility (Ft. Riley Non-Commissioned Officer (NCO) Academy) and soldiers with options of eating in the dining facilities or elsewhere (Ft. Lewis). In addition, because of the probable difference in time in service between these study populations, the sample would include soldiers of varying ages.

Fort Lewis. Soldiers rated the Ft. Lewis dining facility.

Fort Riley. The NCO Academy Dining Facility at Ft. Riley, KS, served as the test site and Primary Leadership Development Course (PLDC) students supported by this dining facility served as the test unit. Although one reason for choosing the NCO Academy for studying food consumption was its mandatory use, for purposes of the questionnaire soldiers were asked to rate their regular home dining facility and not the NCO Academy Dining Facility. This decision was based on their limited exposure to the Ft. Riley facility.

Generalizability. A number of limitations to the generalizability of this study exist. The most striking are the absence of baseline data, the highly select enlisted personnel at Ft. Riley, the small population, the very small female and food service personnel population, the judging by test personnel at Ft. Riley of facilities other than the Ft. Riley contract operation, the possible contamination of the Ft. Riley group situated in one facility while judging a second, the lack of knowledge of nutrition information available at the Ft. Riley soldiers' base facilities, and the uniqueness of the Fort Riley civilian-contractor operation. Also, as only two bases were studied, it is not known if different dining facilities, military food service personnel, or a representative sample would provide similar or different data.

#### METHOD

One hundred forty-two soldiers participated. Eighty-one soldiers, 74 males and 7 females, ranging in age from 19 to 38 years, were from Ft. Riley. Sixty-one soldiers, 39 males and 22 females, ranging in age from 18 to 31 years, were from Ft. Lewis. Thus there were a total of 113 males and 29 females in the study.

### Questionnaire.

The questionnaire (see Appendix) contained three parts: Part I requested background information from the soldiers, Part II assessed food habits, Part III assessed nutrition knowledge and attitudes. Scale information is provided in the results section.

### Procedure.

Data collectors from the U. S. Army Research Institute of Environmental Medicine selected a sample of 50 soldiers at each base and monitored their food consumption at breakfast, lunch, and dinner meals for eight days. On the evening of the last day of the USARIEM study, all soldiers eating at that facility were assembled. The survey administrator distributed questionnaires, explained the nature of the study, obtained written consent, and gave detailed information about the various scales used in the questionnaire.

Some members of the Ft. Riley and Ft. Lewis populations declined to fill out questionnaires. Therefore, the questionnaire sample does not include a subset of all members of the nutrient consumption sample.

### Food Service Personnel.

Interviews were individually conducted by Natick personnel with the twelve food service personnel in the civilian contracted dining hall (Ft. Riley). These personnel were questioned on: (1) their perceptions of the soldiers eating in their facility; and (2) their attitudes toward, and awareness of, the Nutrition Initiatives.

## RESULTS AND DISCUSSION

Data collected from the soldiers at Ft. Riley were compared with data collected from those stationed at Ft. Lewis. Percents are reported in Tables where appropriate. Significant differences were isolated with analysis of variance techniques. Pearson product moment correlations were computed to aid interpretation where necessary. Significance level was set at  $p=0.05$ . Percentages were computed on data collected from the interviews of the food service personnel at Ft. Riley. These results follow the information received from the customers at both installations.

### Customer Demographic Characteristics.

Some population differences occurred on age, sex, education attained, service related attributes, and dining facility usage. General population characteristics and population differences are specified in Tables 1 thru 5.

Eighty percent (113) of the soldiers were male and 20% (29) were female, with the Ft. Lewis population generally younger and

containing most (81%) of the female population (Table 1). Roughly 98% of the soldiers surveyed are high school graduates or better. The Ft. Riley soldiers are generally better educated than the Ft. Lewis soldiers (Table 2). Because of known relationships between nutrition knowledge and education (Murray, 1977),<sup>2</sup> the Ft. Riley soldiers were expected to demonstrate greater nutrition knowledge than the Ft. Lewis soldiers.

Table 1: Demographic Characteristics of Ft. Riley and Ft. Lewis Populations\*

	Ft. Riley	Ft. Lewis
Age:	Mean = 25	Mean = 21
Race/Ethnic:		
Caucasian	79	57
Black	14	28
Hispanic	4	3
Oriental	3	8
Other	1	3
Sex:		
Male	91	64
Female	9	36
Smoking Status:		
Smokers	49	48
Nonsmokers	49	53

\*All figures, except age, are percentages.

Table 2: Education\*

	Ft. Riley	Ft. Lewis
Finished Grade School	1	1
High School Graduate	49	59
Skilled Job Training	6	13
Some College	41	21
College Graduate	3	2

\*Percentages specifying attained education level.

The Ft. Riley population is more likely to receive a rations allowance than the Ft. Lewis population (Table 3). Possibly related to these ration allowance differences, the Ft. Riley soldiers eat fewer of their meals (33%) at the base dining facility than the Ft. Lewis soldiers (52%). Fifty percent of the Ft. Riley and 35% of the Ft. Lewis soldiers eat at least 15 times per week at places other than the base dining facility with the Ft. Riley soldiers tending to eat at private residences and the Ft. Lewis soldiers tending to eat at fast food establishments or from vending machines. Given these



differences, the Ft. Riley soldiers may be exposed less often to the Army's nutrition information than the Ft. Lewis soldiers. In general, exposure tends to increase liking, and Zajonc (1968) has suggested that exposure is a sufficient condition for liking and attitude change.

Table 3: Army Demographic Questions\*

	Ft. Riley	Ft. Lewis
Length of Service (month):		
Mean	60	21
Low-High	(20-193)	(3-74)
Liking for Military Service:		
Dislike	8	30
Neutral	15	19
Like	77	51
Rations Allowance:		
Yes	64	3
No	36	97
Rank:		
E-1	--	8
E-2	--	15
E-3	--	46
E-4	40	30
E-5	55	--
E-6	4	--

\*All figures save length of service are percentages.

Soldiers reported eating an average of 2.3 meals per day and 1.3 (Ft. Riley) or 1.9 (Ft. Lewis) snacks. This result may be age related with the younger Ft. Lewis soldiers more inclined to snack (possibly at vending machines) than the older Ft. Riley soldiers. Roughly 90% of those surveyed were raised on cooking styles that contain high cholesterol breakfast items, such as bacon, ham, sausage, and eggs. Forty-six percent of those surveyed eat eggs daily with an additional 36% eating eggs at least weekly. Soldiers reported being more likely to eat at the base dining facility during the weekdays, with breakfast and the midday meal being better attended than the dinner or late night meal (see Table 4). This suggests that attempts at cholesterol reduction might profitably be targeted at the weekday breakfast meal.

Table 4: Percent Meals Eaten at Home Base Dining Facility all Soldiers

	Breakfast	Mid-Day	Dinner	Late
Night				
Weekdays	57	59	52	14
Weekend	30	43	37	30

### Perceptions of Dining Facility.

Soldiers were asked whether they perceived any problems with the garrison dining facility. Responses were on a scale with anchors labeled significant attraction, minor attraction, neither an attraction nor a problem, minor problem, or significant problem. The numbers of times an item was indicated as a significant or minor problem were computed. The most frequently cited problem areas are shown in Table 5. The Ft. Lewis population is more concerned about the degree of military atmosphere, food quality and quantity, food variety and speed of service or speed of lines than the Ft. Riley population. As Ft. Riley soldiers are from different dining facilities, it was not possible to discover if this results from dining facility quality. Irrespective of test location, female soldiers were more critical of food quality and food variety than males, and the younger soldiers were more critical of quality, variety, and speed of service than older soldiers. As Ft. Lewis contains more female and younger soldiers than Ft. Riley, the differences between these facilities may result from sample differences.

Table 5: General Areas of Concern\*

	Ft. Riley	Ft. Lewis
Quality of food	42	63
Variety of regular meal food (weekday)	40	63
Speed of service or lines	40	53
Monotony of same facility	40	33
Too much military atmosphere	37	42
Hours of operation	36	59
Service by dining facility personnel	33	26
Quantity of food	30	58
Variety of short order food	30	65
Variety of regular meal food (weekend)	29	63
Convenience of location	20	10

\*Percent rating as problem areas.

### Nutrition-Related Behaviors.

Soldiers were questioned on how often they used the salad bar, the criteria they employed in selecting food, how often they took advantage of the low calorie menu, and whether they used the information on the food service menu to track calories. Responses were on a graphic scale with anchors labelled never, monthly, weekly, daily, and six times per day. Responses were spaced logarithmically along the line. The percentage of soldiers indicating responses to these items on a weekly or daily basis are tabulated in Table 6 and reveal that food selection is based on what is liked or looks good rather than on nutritional value. In addition to the differences between test facilities, the Ft. Lewis females are more likely to report using the information on the food service menu to track calories and more likely to take advantage of the low calorie menu than the Ft. Lewis males.

Table 6: Nutrition Related Behavior\*

Ft. Riley		
-----		
How often do you:	Weekly	Daily
-use the salad bar in this facility?	38	25
-choose food based on what you like?	22	71
-choose food based on nutritional content?	14	21
-choose food because the food looks good?	24	38
-use the information on the food service		
menu to keep track of your calories?	7	5
-take advantage of the low calorie menu?	6	3
-----		
Ft. Lewis		
-----		
How often do you:	Weekly	Daily
-use the salad bar in this facility?	27	25
-choose food based on what you like?	14	78
-choose food based on nutritional content?	23	36
-choose food because the food looks good?	23	42
-use the information on the food service		
menu to keep track of your calories?	8	8
-take advantage of the low calorie menu?	16	2

\*Percentages reporting behavior on weekly or daily basis on a logarithmic scale with anchors from never to six times per day.

Soldiers were questioned on how often they ate a number of high salt content foods on the same logarithmic scale that was used for nutrition practice. Table 7 reveals there were many similarities in the two groups in percentages eating high sodium content foods on a weekly and daily basis.

Table 7: Percentages Eating Foods High in Sodium\*

	Ft. Riley		Ft. Lewis	
	Weekly	Daily	Weekly	Daily
Cheese (except cottage)	51	23	30	27
Bread	47	40	36	56
Lunch meats (hams, salamis)	43	13	36	5
Canned Vegetables	42	16	32	18
Bacon	36	14	26	37
Margarine/salted butter	31	24	52	39
Breakfast cereals	31	21	13	31
Pickles/sauces	31	5	39	12
Sausages	31	4	22	8
Crackers	29	3	15	10
Canned/packageged soups	22	1	25	5
Salted peanuts	22	1	20	2
Bouillon	11	3	10	7

\*Percentages reporting eating a particular food on a weekly or daily basis. Scale is logarithmic with anchors never to six times per day.

Additional questions on salt usage revealed 40% of those surveyed salt their food at the table before tasting and agree that salt is important to their enjoyment of food. Over 60% of both populations ascribe to the mistaken belief that additional salt is important on hot, humid days (see Table 8).

Table 8: Sodium Use\*

	Ft. Riley	Ft. Lewis
Do you salt food at the table before tasting it?	46	38
Salt is important to food enjoyment	41	44
It is important to take additional salt on hot humid days if you are very active and are sweating a lot.	66	67

\*Percent indicating answering affirmatively.

Several questions, shown in Table 9, sought to determine soldiers' milk consumption. Sixty percent of the soldiers surveyed drink 1-1/2 or more glasses of milk in an average day. Soldiers state they drink more whole milk than low fat milk with more females drinking whole milk than males.

Table 9: Milk Consumption by Fort\*

	Ft. Riley	Ft. Lewis
Drink 1-1/2 or more glasses of milk in an average day	54	70
Drink milk for strong bones	40	38
Drink low fat milk at least weekly	40	36
Drink whole milk at least weekly	42	60

\*Percentages agreeing with the statement.

#### Nutrition Knowledge.

Some multiple choice questions assessed soldiers' nutrition related knowledge. Table 10 shows most soldiers know that fast food meals are high in salt and fat, the sources of protein, the nutritional benefits of calcium, and the proper caloric intake for young, inactive adults. Fewer soldiers know the major food groups, the characteristics of low fat milk, the food component which provides the highest calories per ounce, the sources of B vitamins, or the sources of carbohydrates.

A nutrition knowledge score was calculated by adding soldier's correct response on each nutrition knowledge question to obtain an overall score. This score was then correlated with a number of indices: education, gender, time in service, weight code, desire to lose weight, and desire to gain weight. One significant correlation occurred. Wanting to lose weight was negatively related to nutrition knowledge. However, this relationship was true for females but not for males.

Table 10: Nutrition Knowledge\*

	Ft. Riley	Ft. Lewis
Calcium helps build bones and teeth	96	88
Which food is in the food group as chicken	94	90
Protein is found in meats, fish, poultry	88	82
Which food is the best choice for a reducing diet	84	75
Fast food meals are high in salt and fat	66	55
Caloric intake for young adults of average weight and low activity level	60	40
Which food is lowest in salt	59	37
Major food groups (fruits, vegetables, milk products, protein)	56	78
In which foods iron is found	56	41
Which choice is not a dietary guideline	52	68
Which food is not a good source of fiber	40	32
Which foods are a good source of B vitamins	39	37
Low fat milk has less calories, less cholesterol and as much calcium and protein as whole milk	28	28
Sugar gives the most energy	28	38
Where carbohydrates are found	24	28

\*Percent giving correct answer.

#### Attitude toward Nutrition Initiatives.

Soldiers' perceptions of the usefulness of the cards used in the serving line to provide calorie and nutrition information were assessed and shown in Table 11. The information available on cards at the Ft. Riley soldiers' home base facilities is unknown. Cards in the line at Ft. Riley contained only calorie information and were color coded on the basis of calorie content. Red, yellow and green represented high, medium, and low calorie content because food service personnel apparently did not understand that the color coding was supposed to represent nutritional and caloric value.

Table 11: Nutrition Practice\*

	Ft. Riley	Ft. Lewis
"Calorie Cards" help me:		
- select food high in nutritional value	22	38
- select food low in calories	31	49

\*Figures are percent who agree with the statement.



The percentage of soldiers finding the cards useful for selecting low calorie food appears low (31% and 49% for Ft. Riley and Ft. Lewis, respectively), but when compared with the percentages at each base attempting weight loss, these percentages are quite respectable. Roughly one-third of the military personnel surveyed are attempting to lose weight. Of the personnel who want to lose weight 35% use the cards (56% of the females and 25% of the males, or 25% at Ft. Riley and 48% at Ft. Lewis).

The cards were less useful for selecting food high in nutritional value. Conceivably, cards in use at the Ft. Riley soldiers home bases do not include nutritional information and many Ft. Lewis soldiers may realize their cards do not contain useful nutrition information. Perhaps because of the prominent calorie information, many soldiers perceive the cards as only providing calorie information. If this is so, adequately reflecting caloric and nutritional value on the cards may improve card use.

Soldiers were queried on several aspects of the food now available in the dining hall. Table 12 shows that irrespective of installation, soldiers think that the food available in the dining hall is not as nutritious as that found in restaurants, and does not help overweight personnel lose weight. Soldiers also think it is not easy to find a low calorie meal in the base dining facility. Forty-four percent of those surveyed agree the food served provides a healthful diet. Fewer than 20% of the population perceive the food as too salty, whereas over 30% think the food too bland.

Table 12: Soldiers' Food Related Attitudes\*

	Ft. Riley	Ft. Lewis
The current food offered in the dining hall:		
- provides a healthful diet	45	43
- tastes bland	30	42
- is as nutritious as in a restaurant	27	36
- helps overweight personnel lose weight	18	35
- lets me find a low calorie meal as easily as at home or at a restaurant	18	40
- tastes salty	15	18

\*Percent agreeing with the statement.

Soldiers were given two alternate foods and asked to choose between them under the conditions of practicing good nutrition, or attempting to lose weight. They were then asked to indicate which food they would ordinarily choose. Tables 13, 14, and 15 report the percentage making the appropriate choice under the conditions specified.

Table 13: Food Items Soldiers Would Choose to Lose Weight\*

	Ft. Riley	Ft. Lewis
Regular/low calorie menu option	78	85
Fresh fruit/pastries	92	92
Low calorie/regular dressings	90	85
Whole/low fat milk	90	93
Fried/baked food	94	90
Reduced/regular portions	89	85
Potatoes with/without gravy	90	86
Frosted Flakes/Shredded Wheat	87	88
Chicken with/without skin	83	90

\*Percent choosing the low calorie alternative.

Table 14: Food Items Chosen as Most Nutritious\*

	Ft. Riley	Ft. Lewis
Butter/margarine	77	79
Low fat/whole milk	81	69
Unsweetened juice/canned soda	91	89
Fried/baked foods	94	82
Herbal seasonings/salt	86	79
Pastries/fresh fruit	96	90
Chicken with/without	82	82

\*Percent choosing the more nutritious alternative.

Table 15: Food that Would Ordinarily be Chosen by Soldiers from two Alternatives\*

	Ft. Riley	Ft. Lewis
Fresh fruit/cakes and pies	73	66
Baked/fried chicken	57	53
Low/High Calorie food	57	52
Whole/Low fat milk	52	43
Buttered/non-battered vegetables	49	40
Potatoes with/without gravy	48	39

\*Percent choosing the low calorie or more nutritious alternative.

Comparing Tables 13, 14, and 15 reveals many soldiers prefer the less nutritious or high calorie item. However, most soldiers know which food, among the alternatives listed, is the appropriate low calorie or more nutritious choice. This suggests soldiers wanting to lose weight can make the appropriate low calorie choice. Further analyses revealed that

soldiers wanting to lose weight choose the low calorie alternative more than the general population. Also, within the population trying to lose weight, more females than males choose the low calorie alternative (see Table 16).

Table 16: Percentage of soldiers wanting to lose weight who choose the Low Calorie Alternative by Gender

	Both Genders	Males	Females
Baked/fried chicken	73	67	82
Low/High Calorie food	80	74	88
Low Fat/Whole Milk	69	68	71
Buttered/non-buttered vegetables	60	44	65
Fruit/Cakes and pies	84	81	88
Plain/Gravied Potatoes	73	70	77

Soldiers' perceptions of the usefulness of the nutrition information are tabulated in Table 17. Roughly 50% of those surveyed think the information is supplied to help them choose nutritious foods and maintain desirable weights; a third think the information increased their nutrition awareness. Few soldiers agree that the nutrition information influences their food selections off the installation or believe the information improved their attitudes toward proper nutrition. Soldiers believe the nutrition information is supplied to aid them with weight control and help them make good nutritional food choices, but believe the food currently available does not reflect this intent.

Table 17: Perceptions of Nutrition Information\*

	Ft. Riley	Ft. Lewis
The nutrition information:		
- is being supplied to help us choose more nutritious foods	49	63
- is being supplied to help Army personnel reach and maintain optimal weight	49	54
- has increased my awareness of proper nutrition	30	34
- has improved my attitude toward proper nutrition	27	31
- has influenced my food choices at restaurant and at home	18	18

\*Percent agreeing with the statement.

#### Weight Effects.

Weight data, in Table 18, show roughly half the population at both Ft. Riley and Ft. Lewis is making some effort to control body weight. Differences between the two populations on height and weight result from the larger number of females in the

Ft. Lewis population. Female soldiers were more likely to report trying to lose weight than the male soldiers.

Table 18: Height and Weight Characteristics

	Ft. Riley		Ft. Lewis	
	Males	Females	Males	Females
Height:	5'9"	5'6"	5'9"	5'4"
Weight:	163	124	164	130
Year Low weight:	158	120	147	123
Year High weight:	168	130	169	139
% trying to lose:	19	43	18	36
% trying to gain:	29	14	33	0

Given the differences in desire to lose weight, the Army's Screening Weight Table with Caution Zone was used to determine if more females than males were overweight. This table lists caution and maximum weights determined by an individual's gender, age (17-19, 20-27, 28-39, 40+), and height. A weight code was computed for each soldier to assign the soldier to one of the following categories: 0, 10+ lb below caution; 1, fewer than 10 lb below caution; 2, between and including caution and maximum; 3, over maximum. Percentages of male and female soldiers for each weight category appear in Table 19 and reveal that although the weight distributions for females appear different than the weight distributions for males, they are not significantly different. Thus the gender difference in effort to lose weight is not because more females than males are overweight. A possible explanation for the greater percentage of female than male soldiers' making some effort to lose body weight is that the female personnel, like females generally in our society, are highly conscious of being overweight.

Table 19: Distribution Among Weight Categories\*

	Weight Category			
	0	1	2	3
Population				
Overall	40	23	17	20
Males (97)	42	26	13	19
Females (23)	30	13	30	26

\*Numbers are percents.

Conceivably, wanting to lose weight may be related to choosing foods based on nutrition. This hypothesis was investigated by computing correlations on desire to lose weight and how often food was chosen based on nutrition for the entire population, for those who are overweight, for each base, and for

soldier's gender. Significant relationships occurred for the entire female population and for the female population stationed at Ft. Lewis. So, for female soldiers, but not for male soldiers the overweight, nutrition awareness and a desire to lose weight are related.

#### Gender Differences.

Analyses were done to explore differences between male and female soldiers in nutrition-related behavior, knowledge, and attitudes. To accomplish this the total population was divided by gender, irrespective of location. Table 20 reports gender differences that are consistent with more female than male soldiers wanting to lose weight.

Table 20: Reported Behavior toward Nutrition by Gender\*

	Males	Females
Choose food based on nutrition		
at least weekly	41	62
Eat two or fewer meals per day	49	86
Add sugar to kool-aid	72	17
Add sugar to lemonade	68	21
Choose if wanting to loose:		
chicken without skin	83	97
fruit over pastry	65	89
baked over fried chicken	50	75
non-gravied potatoes	39	64

\*Percent agreeing with the statement.

Few differences in nutrition related knowledge and attitudes occurred. Female soldiers are more likely to know the properties of low fat milk but less likely to know that water is essential for proper body function.

Gender differences in attitudes toward the Army's Nutrition Initiatives, Table 21, reveal females report using the cards more often than males. As the number who reported card use exceeds the number wanting to lose weight, roughly 8% of the population surveyed use the card information to maintain current weight. Female soldiers appear to be more positive toward the nutrition information and are more likely than male soldiers to report that this information has improved their attitude toward proper nutrition.

Table 21: Attitudes toward Nutrition Initiatives by Gender\*

	Males	Females
The "calorie cards" help me select food low in calories	32	71
The nutrition information:		
-is being supplied to help us choose more nutritious foods	50	74
-has improved my attitude toward proper nutrition	22	52

\*Percent agreeing with the statement.

#### Nutrition Awareness.

Soldiers interested in nutrition or weight control should be more receptive to the nutrition information supplied by the Army than soldiers who are less interested in nutrition or weight control. To investigate this hypothesis the entire population was divided into a nutritionally aware and a nutritionally unaware group based on their responses to the item:

How often do you choose foods based on nutrition content?

Soldiers who made nutritionally based choices at least weekly were designated as nutritionally aware; soldiers who made choices based on nutrition less than weekly were designated as nutritionally unaware. Analyses were done on gender, nutrition-related knowledge, stated behavior and attitudes. Table 22 shows the population of nutritionally aware and unaware soldiers by weight code and gender.

Across weight codes, females are more likely to be nutritionally aware than nutritionally unaware whereas males are more likely to be nutritionally unaware than nutritionally aware, except for individuals who are over maximum weight (weight code 3).

Table 22: Percentage of Nutritionally Aware and Unaware Soldiers  
by Weight Code and Gender

		Weight Code			
		0	1	2	3
Nutritionally Aware					
Males	34	36	46	61	
Females	57	67	57	66	
Nutritionally Unaware					
Males	66	64	54	39	
Females	43	33	43	33	



Table 23 shows soldiers' attitudes toward nutrition by nutrition awareness. Significant differences occurred on all items. The more nutritionally aware soldiers are more positive toward the food offered in the dining hall, the nutrition information supplied by the Army, and the role of proper nutrition than those who are less nutritionally aware.

Table 23: Attitudes toward Nutrition of Nutritionally Aware and Unaware Soldiers\*

	Nutrition Awareness	
	Unaware	Aware
The current food offered in the dining hall provides a healthful diet.	38	51
The nutrition information:		
-has influenced my food choices at restaurants and at home	10	28
-has increased my awareness of proper nutrition	21	45
-has improved my attitude towards proper nutrition	18	41
Proper nutrition:		
-is important to overall health	80	90
-is important to overall fitness	76	91

\*Percentage agreeing with the statement.

#### Food Service Personnel

Food service personnel (n=12) working in the civilian contract dining facility at Ft. Riley were interviewed on their attitudes toward the Nutrition Initiatives and their perceptions of the soldiers nutrition-related attitudes and behaviors. Percentages compiled on these interviews are shown in Tables 24, 25, and 26.

Table 24: Food Service Personnel's Attitudes  
Toward Low Calorie Foods\*

	Percent
It is important to prepare low calorie items at every meal	100
My job is more time consuming now that I am preparing low calorie high nutritious items	25
The number of portions I prepare of high calorie items decreased since the nutrition program was started	17
There is more food waste since I have begun preparing low calorie high nutritious items	0
Low calorie items take more time to prepare	0

\*Percentage agreeing with the statement.

Table 24 reveals very positive attitudes toward low calorie items. All personnel, at this contract dining facility, agree that preparing low calorie foods at every meal is important, think there is no additional food waste, and the preparation time involved for low and high calorie food is similar. However, a few (25%) think their job is more time consuming now that low calorie, high nutritious food items have been added to the standard items.

The food service personnel's attitudes toward the Nutrition Initiatives are shown in Table 25. Whereas most food service personnel (92%) do not agree that providing fresh fruit is difficult, everyone mentioned that supplying fruit other than apples and oranges is difficult. These food service personnel believe customers would choose fruit over pastries on a more frequent basis if a wider variety of fruit were obtainable.

Seventeen percent of the food service personnel think their customers find the cards helpful for food selection. Most food service personnel believe their customers do not use the cards because soldiers attending the PLDC go through the line so rapidly that most never look at them. However, these personnel also believe that females and weight conscious customers find the cards useful.

Table 25: Food Service Personnel's Attitudes  
toward Nutrition Initiatives\*

	Percent
My customers find the "calorie cards" helpful in food selection	17
Providing fresh fruit at each meal is difficult	8
There is no need to reduce the amount of salt in the standard recipes	8

\*Percentage agreeing with the statement.

Although most food service personnel agree that high calorie food is not necessary for the troops to do their jobs well, they support or are neutral on having eggs available for breakfast, and meat and potatoes available at every meal. Moreover, consistent with the information from the troops, they believe the troops know the low calorie and high nutritious items, but believe most troops prefer and would choose the high calorie items.

Table 26: Food Service Personnel's Perceptions  
of Troops\*

	Percent
Troops should have:	
* eggs available for breakfast each day	42
* a breakfast of eggs, some meat, potatoes toast and coffee	67
* meat and potatoes at every meal	73
* high calorie food to do their jobs well	42
Troops would choose:	
fried/baked chicken	8
low/high calorie food	33
whole/low fat milk	50
non-buttered/buttered vegetables	58
fresh fruit/cakes and pies	25
potatoes with/without gravy	8

\*Percentage agreeing with the statement or selecting the low calorie or more nutritious alternative.

#### CONCLUSIONS

This study was designed to assess the impact of the U.S. Army's Nutrition Initiatives on the awareness, perceptions, attitudes, behaviors, and nutrition knowledge of both soldiers eating in garrison dining facilities and food service personnel

working in these facilities towards these initiatives. This effort was part of a larger study conducted by U.S. Army Research Institute of Environmental Medicine that included measures of nutrient consumption and menu utilization. Soldiers attending the NCO Academy PLDC course at Ft. Riley and soldiers stationed at Ft. Lewis were chosen as test units by FORSCOM and TRADOC.

One hundred forty-two soldiers, 113 males and 29 females, and 12 food service personnel participated. Soldiers completed a three-part questionnaire designed to assess soldiers' background, nutrition knowledge and awareness, nutrition behaviors, and nutrition-related attitudes and perceptions. Food service personnel were interviewed on their perceptions and attitudes toward the Nutrition Initiatives.

Results reveal the soldiers were more likely to eat at the base dining facility on the weekdays, with breakfast and the midday meal being better attended than the dinner or late night meal. Most soldiers reported that they were raised on a cooking style which is characterized by high cholesterol breakfast items. They were more likely to select food based on historical preferences or appearances than nutritional value. Few soldiers reported using the nutrition information away from the dining facility. More soldiers find the calorie content and nutritional value cards in the dining facility more helpful in selecting low calorie foods than in selecting items high in nutritional value. Most soldiers believe the Army is supplying the nutrition information to aid weight control, and help them make good nutritional food choices, but believe the food currently available does not reflect the Army's intent.

There were some gender differences. More females than males want to lose weight and know the low calorie food choice. Soldiers at both bases are similar in nutrition-related knowledge and this knowledge is unrelated to education. Most soldiers know the negative aspects of fast food meals, the sources of protein, the desirable aspects of calcium, and the proper caloric intake for young, inactive adults. Few soldiers know all the characteristics of low fat milk, the nutrient which provides the highest calories per ounce, the major food groups, the sources of B vitamins, and carbohydrates.

Some soldiers select food based on nutritional value, and some soldiers use the information provided to track their caloric consumption. Thirty-five percent of the soldiers wanting to lose weight use the calorie and nutrition content cards to choose food.

Data suggest salt usage and cholesterol intake by consuming eggs and red meat may be highly entrenched, possibly resulting from attitudes developed from parental eating styles. The

self-reported results on sodium consumption indicate that 40% of this sample salt their food before tasting it, and 60% indicate that salt is important to their enjoyment of food. When asked to choose the lower calorie or more nutritious item of two alternatives, most soldiers were able to choose the more nutritious or low calorie item. However, fewer soldiers choose to eat the lower calorie or more nutritious item. Those trying to lose weight choose the low calorie alternative more often than those not wanting to lose weight. Soldiers may not have acquired specific knowledge about nutrition, such as sources of B vitamins, but have acquired practical knowledge about nutritional food choices. Food service personnel are positive towards the Nutrition Initiatives. Food service personnel report that females and weight conscious soldiers use the food information cards.

#### RECOMMENDATIONS

Whether soldiers' knowledge, awareness, and attitudes have been enhanced by the nutrition program or by some other means is unknown. A study testing soldiers immediately after joining the Army and again at the end of a year's exposure to the Army's Nutrition Initiatives, or a study with proper controls would provide a better understanding of the effect of the Army's Nutrition Initiatives on soldiers' attitudes, awareness, behavior and knowledge.

This document reports research undertaken at the US Army Natick Research, Development and Engineering Center and has been assigned No. NATICK/TR-88/022 in the series of reports approved for publication.

#### LIST OF REFERENCES

1. U.S. Senate Select Committee on Nutrition and Human Needs. (1977) Dietary goals for the United States. 2nd edition. Washington D.C.: Government Printing Office.
2. Murray, B. K. (1977) Testing consumers' knowledge of food and nutrition. Food Product Development, 11, 15-17.
3. Looker, A., Walker, S., Hamilton, L., and Shannon, B. (1982) Evaluation of two nutrition education modules for hospital staff members. Journal of American Dietetic Association, 81, 158-163.
4. Carruth, B. R., and Musgrave K.O. (1979) Changing attitudes in community nutrition. Journal of Nutrition Education, 11, 127-132
5. van den Reek, M., and Keith, R. E. (1984) Knowledge and use of United States dietary goals by university students. Nutrition Reports International, 29, 559-564.
6. Schnakenberg, D. D. (29 May, 1986) Letter to Director Science and Advanced Technology Directorate
7. Zajonc, R. B. (1968) Attitudinal effects of mere exposure. Journal of Personality and Social Psychology Monograph Supplement, 9, 1-27.



## APPENDIX

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HUMAN TEST VOLUNTEER AGREEMENT - DA PERSONNEL  
(NRDC-M 70-4)

NOTICE REQUIRED BY THE PRIVACY ACT OF 1974 (5 U.S.C. 552a)

1. Authority: Section 301 of Title 5, U.S. Code; Sections 1071-1087 and 3012 of Title 44, U.S. Code; and Executive Order 9397.
2. Principal Purposes: To satisfy the scientific objectives of the study, to provide minimum information necessary to contact you later should it be in your best interests to do so, or should you require medical treatment for a condition resulting from your participation in this study.
3. Routine Uses: This information will be used as a record of your participation in this study, in analyzing the results of the study, and in reporting or publishing results of the study without identifying the individual participants. The information also may be used to implement health and communicable disease control programs including reporting of medical conditions as required by law to other federal, state, and local agencies, and to adjudicate claims and determine benefits.
4. Mandatory or Voluntary Disclosure and Effect on Individual Not Providing Information: Disclosure of requested information is voluntary. If requested information is not furnished, your participation in this study may be prevented or terminated.

A. VOLUNTEER AGREEMENT  
(Please Print)

I, \_\_\_\_\_, having full capacity to consent, do hereby volunteer to participate in a research study entitled: Garrison Dining Facility Nutrition Research Study under the direction of Major Dawn Carlson.

The implications of my voluntary participation; the nature, duration, and purpose; the methods and means by which it is to be conducted; and the inconveniences and hazards which may reasonably be expected have been explained to me by: Dr. Barbara Quigley, and are set forth on the reverse and any additional pages of this Agreement, which I have initialed. I have been given an opportunity to read and to keep a copy of this Agreement and to ask questions concerning this study. Any such questions have been answered to my full and complete satisfaction. Should any further questions arise, I will be able to contact: Major Dawn Carlson at Autovon 256-4813.

I understand that I may revoke my consent and withdraw from the study at any time without prejudice. I may be required to undergo certain further examinations if, in the opinion of the attending physician, such examinations are necessary for my health or well-being.

I understand that medical treatment is available for any injury or illness which results from my participation in this study and that there are no provisions for payment or compensation specifically for such illness or injury. Further information on the rights of human subjects may be obtained from the Office of Chief Counsel, US Army Natick Research and Development Center (Natick R&D Center), ext. 4322.

\_\_\_\_\_  
Signature, Test Subject

\_\_\_\_\_  
Permanent Address

I was present during the explanation and question period referred to and have witnessed the signature above.

\_\_\_\_\_  
Witness' Signature

\_\_\_\_\_  
Date

(Continued, over)

**B. DESCRIPTION OF STUDY**  
(by Responsible Investigator)

In the past two years the Army has taken a number of steps to improve the nutritional status and fitness of its personnel. In order to know whether this program has been effective and to determine ways in which it can be improved, we are giving this questionnaire to troops at a number of bases. The questionnaire will find out whether people are aware of this program, what they think about it, whether they have changed their food related behaviors and what the program has taught them about nutrition.

All data and medical information obtained about you as an individual will be considered privileged and held in confidence; you will not be identified in any presentation of the results. Complete confidentiality cannot be promised, particularly to military personnel, because information bearing on your health may be required to be reported to appropriate medical or command authorities; and applicable regulation "notes the possibility that the Food and Drug Administration and USAMRDC (officials) may inspect the records".

Your answers to these questions will provide a basis for evaluating whether this program is working and how it can be improved. Thank you for your cooperation.

---

Signature of Responsible Investigator      Organization

Initialed by test subject: \_\_\_\_\_

I. Background information. This section provides information that enables us to group individuals with similar backgrounds together in our analyses.

Read each question carefully and fill in the space provided with your responses. Certain questions have specific instructions associated with them. Please read these instructions carefully.

1. INSTALLATION CODE (To be supplied by testers.)  
\_\_\_\_\_

2. DINING FACILITY CODE (To be supplied by testers.)  
\_\_\_\_\_

3. Indicate your AGE at last birthday. \_\_\_\_\_

4. Check the space next to your RACE.

\_\_\_\_Caucasian                      \_\_\_\_Hispanic  
\_\_\_\_Black                            \_\_\_\_Other(specify)\_\_\_\_\_  
\_\_\_\_Oriental

5. Indicate your SEX.            \_\_\_\_Male            \_\_\_\_Female

6. What is your current height? \_\_\_\_\_ weight \_\_\_\_\_

7. Do you smoke?            Yes \_\_\_\_\_ No \_\_\_\_\_

8. Are you trying to lose weight? Yes \_\_\_\_\_ No \_\_\_\_\_

9. Are you trying to gain weight? Yes \_\_\_\_\_ No \_\_\_\_\_

10. If you are trying to lose weight indicate how much by checking the box below  
\_\_\_\_a)5-10      \_\_\_\_b)10-20      \_\_\_\_c)20-30      \_\_\_\_d)more than 30 lbs.

11. If you are trying to gain weight indicate how much be checking the box below  
\_\_\_\_a)5-10      \_\_\_\_b)10-20      \_\_\_\_c)20-30      \_\_\_\_d)more than 30 lbs.

12. How much did you weight when you entered the Army? \_\_\_\_\_

13. How much has your weight changed over the past year?  
low weight during year \_\_\_\_\_  
high weight during year \_\_\_\_\_

14. Indicate your HIGHEST LEVEL OF EDUCATION.

\_\_\_\_Some Grade School  
\_\_\_\_Finished Grade School  
\_\_\_\_Some High School  
\_\_\_\_High School Graduate (includes GED)  
\_\_\_\_Skilled Job Training  
\_\_\_\_Some College  
\_\_\_\_College Graduate  
\_\_\_\_Beyond College

15. How long have you been IN MILITARY SERVICE?

\_\_\_\_\_years \_\_\_\_\_months

16. How much do you LIKE MILITARY SERVICE? Circle the number which represents your opinion.

Dislike very much	Dislike moderately	Dislike a little	Neutral	Like a little	Like moderately	Like very much
1	2	3	4	5	6	7

17. Indicate your PRESENT Rank. \_\_\_\_\_

18. Do you receive a SEPARATE RATIONS ALLOWANCE (money instead of meal cards)?

\_\_\_\_\_YES  
\_\_\_\_\_NO

19. What ONE TYPE OF COOKING were you raised on? Mark the appropriate line.

_____Chinese	_____Jewish
_____English	_____Mexican
_____French	_____New England
_____General American Style	_____Polish (& Eastern Europe)
_____German	_____Soul
_____Greek	_____Southern
_____Italian	_____Spanish (not mexican)
_____Japanese	_____Seafood
	_____Other (please specify _____)

20. If you are free to choose where you eat your meals during the week WHICH MEALS DO YOU EAT AT YOUR DINING FACILITY? If you have "brunch" on Saturdays or Sundays, consider it to be a mid-day meal. Be sure to mark each block.

	Mon. Yes No	Tues. Yes No	Wed. Yes No	Thurs. Yes No	Fri. Yes No	Sat. Yes No	Sun. Yes No
Breakfast	_____	_____	_____	_____	_____	_____	_____
Mid-day meal	_____	_____	_____	_____	_____	_____	_____
Evening Meal	_____	_____	_____	_____	_____	_____	_____
After Evening	_____	_____	_____	_____	_____	_____	_____

21. WHERE DO YOU EAT when you do not eat in the military dining facility?  
Indicate how often by filling in one blank in each line.

	Never	Less than once a week	1-3 times a week	4-7 times a week	8-14 times a week	15 or more a week
a. Private residence (girlfriend's house, friend's or relative's house, your home, your barracks, bringing your food, etc.)	_____	_____	_____	_____	_____	_____
b. An installation snack facility (the bowling alley, the exchange, etc.)	_____	_____	_____	_____	_____	_____
c. An installation NCO club, EM or Airmen Club, or service club	_____	_____	_____	_____	_____	_____
d. Diner, snack bar, pizza parlor, or drive-in off the installation (or having it delivered)	_____	_____	_____	_____	_____	_____
e. Quality restaurant off the installation	_____	_____	_____	_____	_____	_____
f. Bar or tavern (with alcoholic beverages) off the installation	_____	_____	_____	_____	_____	_____
g. From vending machines	_____	_____	_____	_____	_____	_____
h. From mobile snack or lunch trucks	_____	_____	_____	_____	_____	_____
i. Other (write it below and indicate how often)	_____	_____	_____	_____	_____	_____

22. Listed below are 14 GENERAL AREAS OF CONCERN. For each topic or area indicate whether it is a significant problem, a minor problem, neither a problem nor an attraction, a minor attraction, or a significant attraction for this dining facility in your opinion.

area or topic	Signifi- cant Problem	Minor Problem	Neither Problem Nor Attrac- tion	Minor Attrac- tion	Signifi- cant Attrac- tion
a. Convenience of location	_____	_____	_____	_____	_____
b. General dining facility environment	_____	_____	_____	_____	_____
c. Too much military atmosphere	_____	_____	_____	_____	_____
d. Expense	_____	_____	_____	_____	_____
e. Hours of operation	_____	_____	_____	_____	_____
f. Monotony of same facility	_____	_____	_____	_____	_____
g. Quality of food	_____	_____	_____	_____	_____
h. Quantity of food	_____	_____	_____	_____	_____
i. Service by dining facility personnel	_____	_____	_____	_____	_____
j. Variety of regular meal food (weekday only)	_____	_____	_____	_____	_____
k. Variety of the regular meal food (weekend only)	_____	_____	_____	_____	_____
l. Variety of the short order food	_____	_____	_____	_____	_____
m. Speed of service or lines	_____	_____	_____	_____	_____

23. If you have a REGULARLY SCHEDULED ACTIVITY which keeps you from attending the dining facility at certain times, indicate how many meals per week you do not attend because of this activity. (Indicate "zero meals not attended" if you have no such activity.)

Meals not attended:	0	1	2-4	5	6-7	8-10	More than 10
	_____	_____	_____	_____	_____	_____	_____



## II. Food use questions.

Please answer the following questions by placing a mark on the line that best represents how often you do a particular activity.

24. How often do you drink beer, wine or mixed drinks?  
 Never      Monthly      Weekly      Daily      6x a day
25. How often do you use the salad bar in this dining facility?  
 Never      Monthly      Weekly      Daily      6x a day
26. How often do you choose food based on what you like?  
 Never      Monthly      Weekly      Daily      6x a day
27. How often do you choose foods based on nutrition content?  
 Never      Monthly      Weekly      Daily      6x a day
28. How often do you choose food because the food looks good?  
 Never      Monthly      Weekly      Daily      6x a day
29. How often do you use the information now available to you on the food service menu to keep track of your caloric consumption?  
 Never      Monthly      Weekly      Daily      6x a day
30. If available, how often do you take advantage of the low calorie menu?  
 Never      Monthly      Weekly      Daily      6x a day  
 N/A \_\_\_\_\_
31. How often do you drink low fat milk?  
 Never      Monthly      Weekly      Daily      6x a day
32. How often do you drink whole milk?  
 Never      Monthly      Weekly      Daily      6x a day
33. Please indicate how often you eat the following foods by marking the appropriate place in the line next to the name of the food.
- |  | Never | Monthly | Weekly | Daily | 6x a day |
|--|-------|---------|--------|-------|----------|
| 1. Breakfast cereals (Except puffed wheat, sugar puffs and shredded wheat) |       |         |        |       |          |
| 2. Eggs  |       |         |        |       |          |
| 3. Bread   |       |         |        |       |          |
| 4. Green Salad   |       |         |        |       |          |
| 5. Margarine or salted butter  |       |         |        |       |          |
| 6. Bananas   |       |         |        |       |          |
| 7. Cheese(except cottage cheese)   |       |         |        |       |          |
| 8. Beer  |       |         |        |       |          |
| 9. Bacon   |       |         |        |       |          |



42. I eat lots of carbohydrates to improve my endurance.

Always    1    2    3    4    5    6    7    Never

43. I eat lots of citrus fruits to avoid colds and flu.

Always    1    2    3    4    5    6    7    Never

44. How much milk do you drink in an average day?

- ☐ a. none
- ☐ b. 1/2 glass
- ☐ c. 1 glass
- ☐ d. 1 1/2 glass
- ☐ e. 2 glasses
- ☐ f. more than 2 glasses

45. Do you add salt to the following foods at the table?

	YES	NO	Don't eat that food
meat	_____	_____	_____
french fries	_____	_____	_____
boiled eggs	_____	_____	_____
eggs(other than boiled)	_____	_____	_____
tomatoes	_____	_____	_____
boiled potatoes	_____	_____	_____
baked potatoes	_____	_____	_____
boiled rice	_____	_____	_____
spaghetti or other pasta	_____	_____	_____
cooked breakfast cereals	_____	_____	_____

List other foods you normally add salt too:

46. Do you add sugar to the following foods at the table?

	YES	NO	Don't eat that food
coffee	_____	_____	_____
tea	_____	_____	_____
hot cereal	_____	_____	_____
cold cereal	_____	_____	_____
french toast	_____	_____	_____
grapefruit	_____	_____	_____
grapes	_____	_____	_____
blueberries	_____	_____	_____
macaroni	_____	_____	_____
strawberries	_____	_____	_____
kool-aid	_____	_____	_____
lemonade	_____	_____	_____

List other foods you normally add sugar to:

III. Nutrition Knowledge. This section provides information related to overall nutrition knowledge. We do not expect you to know all the correct answers.

Please circle the letter next to the correct answer for each question. Circle only one letter for each question.

47. Fast food meals are usually:
- a. high in protein and low in salt
  - b. not at all nutritious
  - c. high in salt & fat
  - d. high in sugar & low in fat
  - e. high in fiber
48. Calcium:
- a. is a major source of energy
  - b. helps build bones and teeth
  - c. is found primarily in eggs
  - d. is found primarily in fruits
  - e. is toxic in your diet
49. Protein is found in:
- a. vegetable oil
  - b. meats, fish, and poultry
  - c. fruits
  - d. meats only
  - e. none of the above
50. Carbohydrates are:
- a. found in grains
  - b. higher in calories than fats
  - c. building blocks of protein
  - d. found in meats
  - e. higher in calories than proteins
51. Lean meats are a good source of:
- a. vitamin E
  - b. the B vitamins
  - c. vitamin C
  - d. vitamin D
  - e. carbohydrates
52. Iron:
- a. is found in cheese
  - b. is a kind of vitamin
  - c. is found in salt
  - d. is found in whole grains and red meats
  - e. none of the above
53. Lowfat milk has:
- a. fewer calories than whole milk
  - b. less cholesterol than whole milk
  - c. as much calcium and protein as whole milk
  - d. a & b only
  - e. all of the above

54. Which nutrient gives the MOST energy (calories) per ounce?
- fat
  - protein
  - carbohydrate
  - sugar
  - vitamins
55. Which food is in the SAME food group as chicken?
- yogurt
  - fish
  - potatoes
  - apples
  - cereal
56. Which entree is the BEST choice for a reducing diet?
- fried chicken
  - broiled fish
  - broiled steak
  - macaroni & cheese
  - ham & cheese sandwich
57. Which food is LOWEST in sodium (salt)?
- american cheese
  - baked potato
  - canned tomato soup
  - bologna
  - corn flakes
58. Young adult men of average weight and low activity should consume about how many calories per day?
- 500
  - 7,000
  - 3,000
  - 1,000
  - 5,000
59. Which of the following is NOT a good source of fiber?
- carrots
  - popcorn
  - steak
  - almonds
  - celery
60. What are the four major food groups?
- protein, grains & cereals, milk products, and meats
  - milk products, grains & cereals, fruits & vegetables, and meats
  - fruits, vegetables, milk products, and proteins
  - milk products, grains & cereals, fats & oils, meats
  - none of the above
61. Which of the following is NOT one of the dietary guidelines?
- If you drink alcohol, do so in moderation.
  - Reduce your consumption of sodium (salt).
  - Eat a variety of foods.
  - Reduce your consumption of starches.
  - Reduce your consumption of sugar.

Instructions: Each of the following statements is either true or false. Circle a T or F before each statement to indicate true or false.

62. T F Butter is a type of unsaturated fat.
63. T F Dietary fiber such as bran speeds the movement of food through the digestive tract.
64. T F Alcohol consumption has no effect on vitamin needs.
65. T F Water is essential for the body to function properly.
66. T F A man (157 lbs.) can "burn off" a cup of ice cream by walking for thirty minutes.
67. T F Fat is more than twice the calories as carbohydrate.
68. T F It is necessary to take a vitamin pill to obtain all the essential nutrients.
69. T F The ingredients listed on food labels are arranged in order of decreasing quantity.
70. T F If food additives (like preservatives and colors) are safe, they do not have to be listed on food label.
71. T F When you're physically active, you need more calories than when you're inactive.
72. T F Ice cream is a good source of calcium.
73. T F Margarine has fewer calories than butter.
74. Which of these choices would help you practice better nutrition?  
(place an A or B in the column to the right to indicate your choice for each item).

A	B	
butter	margarine	_____
low fat (2%) milk	whole milk	_____
unsweetened juice	canned soda	_____
fried foods	baked foods	_____
herbal seasonings	salt	_____
pastries	fresh fruit	_____
chicken with skin	chicken without skin	_____

75. If you were trying to lose weight, which would you choose, A or B?  
(place your choice, either A or B, in the space provided to the right  
of the item).

A  
regular menu option  
fresh fruit  
low calorie dressings  
whole milk  
fried food  
reduced portions  
potatoes with gravy  
Frosted Flakes  
chicken with skin

B  
low calorie menu option \_\_\_\_\_  
pastries \_\_\_\_\_  
regular dressings \_\_\_\_\_  
low fat (2%) milk \_\_\_\_\_  
baked food \_\_\_\_\_  
regular portions \_\_\_\_\_  
potatoes without gravy \_\_\_\_\_  
Shredded Wheat \_\_\_\_\_  
chicken without skin \_\_\_\_\_

76. I would chose (place your choice, A or B, in the space provided in the  
right of the item).

A  
baked chicken  
low calorie food  
whole milk  
non-buttered vegetables  
fresh fruit  
gravied potatoes

B  
fried chicken \_\_\_\_\_  
high calorie food \_\_\_\_\_  
low fat milk \_\_\_\_\_  
buttered vegetables \_\_\_\_\_  
cakes and pies \_\_\_\_\_  
plain potatoes (no gravy) \_\_\_\_\_

Instructions: For the items listed below we would like you to use the  
following 1-5 point scale to rate your agreement or disagreement with the  
statement. In some cases there are no right or wrong answers. We are  
seeking you opinions.

- |   | 1        | 2        | 3          | 4     | 5        |
|---|----------|----------|------------|-------|----------|
|   | strongly | disagree | neutral or | agree | strongly |
|   | disagree |          | undecided  |       | agree    |
| 77. If I eat a lot of candy and sweets I feel jumpy<br>and nervous afterwards.  | 1        | 2        | 3          | 4     | 5        |
| 78. After eating chinese food I often get headaches.  | 1        | 2        | 3          | 4     | 5        |
| 79. Candy makes young children overly active and wild.  | 1        | 2        | 3          | 4     | 5        |
| 80. Honey is a more nutritious sweetener than sugar.  | 1        | 2        | 3          | 4     | 5        |
| 81. It is important to take additional salt on hot<br>humid days if you are very active and are<br>sweating a lot.                      | 1        | 2        | 3          | 4     | 5        |
| 82. If I eat a wide variety of foods I will get<br>enough vitamins and minerals and don't need<br>vitamin pills or mineral supplements. | 1        | 2        | 3          | 4     | 5        |
| 83. High sugar foods are a leading cause of cavities<br>and tooth decay.  | 1        | 2        | 3          | 4     | 5        |
| 84. The best way to lose weight is to eat fewer<br>foods that are high in carbohydrates such as<br>bread, pasta, and rolls.             | 1        | 2        | 3          | 4     | 5        |
| 85. Many people have trouble losing weight because<br>their metabolism is too low.  | 1        | 2        | 3          | 4     | 5        |
| 86. I can drink 4 beers in an hour and still drive<br>safely.   | 1        | 2        | 3          | 4     | 5        |

Please answer all questions referring to the present dining hall.

1	2	3	4	5
strongly	disagree	neutral or	agree	strongly
disagree		undecided		agree

If you dining hall uses "calorie cards" answer 87, if not please skip to 88.

- |     |  |   |   |   |   |   |
|-----|--|---|---|---|---|---|
| 87. | The "calorie cards" help me:                 |   |   |   |   |   |
|     | a. select food high in nutritional value     | 1 | 2 | 3 | 4 | 5 |
|     | b. select food low in calories               | 1 | 2 | 3 | 4 | 5 |
|     | c. by decreasing my time in the line         | 1 | 2 | 3 | 4 | 5 |
| 88. | the current food offered in the dining hall: |   |   |   |   |   |
|     | a. provides a healthful diet                 | 1 | 2 | 3 | 4 | 5 |
|     | b. helps overweight personnel lose weight    | 1 | 2 | 3 | 4 | 5 |
|     | c. tastes bland                              | 1 | 2 | 3 | 4 | 5 |
|     | d. is as nutritious as in a restaurant       | 1 | 2 | 3 | 4 | 5 |
|     | e. lets me find a low calorie meal as easily |   |   |   |   |   |
|     | as at home or at a restaurant                | 1 | 2 | 3 | 4 | 5 |
|     | f. tastes salty                              | 1 | 2 | 3 | 4 | 5 |
| 89. | The nutritional information:                 |   |   |   |   |   |
|     | a. has influenced my food choices at         |   |   |   |   |   |
|     | restaurants and at home                      | 1 | 2 | 3 | 4 | 5 |
|     | b. is being supplied to help us choose more  |   |   |   |   |   |
|     | nutritious foods                             | 1 | 2 | 3 | 4 | 5 |
|     | c. is being supplied to help Army personnel  |   |   |   |   |   |
|     | reach and maintain optimal weight            | 1 | 2 | 3 | 4 | 5 |
|     | d. has increased my awareness of proper      |   |   |   |   |   |
|     | nutrition                                    | 1 | 2 | 3 | 4 | 5 |
|     | e. has improved my attitude toward proper    |   |   |   |   |   |
|     | nutrition                                    | 1 | 2 | 3 | 4 | 5 |
| 90. | Proper nutrition:                            |   |   |   |   |   |
|     | a. is important to overall health            | 1 | 2 | 3 | 4 | 5 |
|     | b. is important to overall fitness           | 1 | 2 | 3 | 4 | 5 |



# Food Service Personnel Interview

Please answer all questions referring to the present dining hall.

If you label items, which items tend to go faster: red, yellow, or green?  
red\_\_\_\_\_ yellow\_\_\_\_\_ green\_\_\_\_\_ don't label\_\_\_\_\_ don't know\_\_\_\_\_

The number of portions I prepare of high calorie items decreased since the nutritional program was started.  
agree\_\_\_\_\_ disagree\_\_\_\_\_ don't know\_\_\_\_\_

For the items listed below we would like you to use the following  
1-5 point scale to rate your agreement of disagreement with the statement.

Strongly Disagree	Disagree	Neutral or Undecided	Agree	Strongly Agree	
1	2	3	4	5	
It is important to prepare low calorie items at every meal.					1 2 3 4 5
There is more food waste since I have begun preparing low calorie high nutritious items.					1 2 3 4 5
My job is more time consuming now that I am preparing low calorie high nutritious items.					1 2 3 4 5
Providing fresh fruit at each meal is difficult.					1 2 3 4 5
My customers find the "calorie cards" helpful in food selection.					1 2 3 4 5
Low calorie items take more time to prepare than food we generally prepare.					1 2 3 4 5
There is no need to reduce the amount of salt in the standard recipes.					1 2 3 4 5
Troops should have:					
eggs available for breakfast every day					1 2 3 4 5
high calorie food to do their jobs well					1 2 3 4 5
A good breakfast of eggs, some meat, potatoes, toast and coffee.					1 2 3 4 5
meat and potatoes at each meal					1 2 3 4 5

The troops in my dining hall would choose: (place your choice, either A or B in the space provided to the right of the items.)

A	B
baked chicken	fried chicken _____
low calorie food	high calorie food _____
whole milk	low fat milk _____
non-buttered vegetables	buttered vegetables _____
fresh fruit	cakes and pies _____
potatoes with gravy	potatoes without gravy _____

